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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,226	03/02/2004	Patrick Kappler	FR-AM1932 NP	3636

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ARKEMA INC.
PATENT DEPARTMENT - 26TH FLOOR
2000 MARKET STREET
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EXAMINER	
HU, HENRY S	

ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 06/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/791,226	KAPPLER ET AL.	
	Examiner	Art Unit	
	Henry S. Hu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *election and amendment of April 27, 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) *7-11* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☒ Claim(s) *4* is/are objected to.

8)☒ Claim(s) *1-11* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3-2-2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The Applicants are reminded to send **a certified copy of priority paper of "FR 03.02531"** for this application. **Otherwise, foreign priority date of March 3, 2003 is not granted**. This Office Action is in response to the faxed Election with amendment on claims filed on April 27, 2005. **Claims 1 and 6 were amended.** To be more specific, Claim 1 was amended to be in a better format as a process claim, while originally parent Claim 6 becomes dependent from parent Claim 1.

The Examiner accepts **Applicant's election of Group I (Claims 1-5) coupling with Claim 6 of Group II by changing it to a dependent claim.** However, such an election is **traversed** with remarks on page 5. The traversal is on the ground(s) that it would not place an undue burden to search and examine the non-elected Group III (Claims 7-11) with the elected Group I/II (Claims 1-6 now) since they are so closely related in the field of PVDF polymers. This is not found persuasive because each of Group I/II and Group III is drawn to a technology apparently requiring search in different classification area. In the instant case Group I/II was drawn to a process of making polyvinylidene fluoride (PVDF) homo- or co-polymer, while Group III was drawn to polyvinylidene fluoride (PVDF) homo- or co-polymer comprising sodium acetate, a potassium alkylsulphonate, a surface-active additive and with chain ends of $-CF_2-CH_2-O-SO_3^-$.

As discussed earlier, process Groups III and I/II are **actually producing two different PVDF polymers** due to the presence or absence of other monomeric components. **Group III** relates to a polyvinylidene fluoride (PVDF) homo- or co-polymer comprising sodium acetate, a potassium alkylsulphonate, a surface-active additive and with chain ends of $-CF_2-CH_2-O-SO_3^-$, while each of **Group I/II II** is related to a process or a methodology. Such a specific polymer disclosed in Invention III may relate to one option of many polymers produced from Invention I or Invention II. However, different type of chain end as well as metallic content may be obtained by using different component or step in most of the cases. Therefore, the scope of the claims, i.e., the metes and boundaries are distinct.

The requirement is still deemed proper and is therefore made **FINAL**. In summary, this application contains original Claims 7-11, which is drawn to an invention non-elected with traverse. A complete reply to the final rejection must include cancellation of non-elected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01. **Claims 1-11 are pending now,** while the non-elected **Claims 7-11** are withdrawn from consideration. An action follows.

Claim Objections

2. Claim 4 is objected to because of the following informalities:

On **Claim 4** at lines 2-3, phrase of "chosen from **potassium** ethylsulphonate,

methyl-sulphonate, isopropylsulphonate **and** n-propylsulphonate" has a total of three informalities. It should be changed to "chosen from **a potassium salt of** ethylsulphonate, **methylsulphonate**, isopropylsulphonate **or** n-propylsulphonate" as marked.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-6 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-6 of copending Application No. **10/791,233**, now **USPG-PUB 2004/0225096 A1 to Kappler et al**. (with priority date 3-3-2003).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

4. **Parent Claim 1 and its dependent Claims 2-6** of present invention relate to a four-step process of making polyvinylidene fluoride (PVDF) homopolymer or copolymer in the presence of sodium acetate and a persulphate initiator, optionally a potassium alkylsulphonate, optionally a surface-active additive and optionally a paraffin wax.

In a close examination, **Claims 1-6** in copending Application No. **10/791,233**, now **USPG-PUB 2004/0225096 A1 to Kappler et al.**, relate to a four-step process for making a PVDF homopolymer or copolymer. Although the process may involve some substeps or use different sequence somewhat different from the process used to make PVDF polymers of current application, they are using fundamentally the same components in the process. The key is that optionally use is on "a potassium alkylsulphonate, a surface-active additive and a paraffin wax". Therefore, the process of making such a PVDF homo polymer or copolymer would be obviously the same or similar since it always contain some sodium acetate.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. *The limitation of parent* ***Claim 1*** *in present invention relates to Process for the manufacture of polyvinylidene fluoride (PVDF) homopolymer or copolymer comprising synthesizing by radical polymerization of vinylidene fluoride (VDF), and optionally of a comonomer,* ***in aqueous dispersion and in the presence of a transfer agent, of a persulphate as radical initiator****, optionally of a surface-active additive and optionally of a paraffin wax, in which:*

a) ***sodium acetate is added****, either at the start of or during or after the polymerization,*

b) ***a potassium alkylsulphonate is optionally added*** *after the polymerization,*

c) ***an aqueous PVDF dispersion is obtained****,*

d) the PVDF is collected by atomizing the dispersion obtained in c) with air at a temperature of between 120 and 220 °C, ***the aqueous dispersion obtained in c) not being washed with water before atomizing****.*

See other limitations of dependent ***Claims 2-6****.*

7. Claims 1-3 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Blaise et al. (US 4,025,709).

Regarding the limitation of parent **Claim 1**, **Blaise** et al. disclose a process for the emulsion **polymerization or copolymerization of vinylidene fluoride** in the presence of (A) **potassium persulfate** (free radical initiator), (B) **a fluorinated emulsifier**, (C) **sodium acetate** and (D) **paraffin** (column 1, line 65 – column 2, line 1; column 2, line 40-44). Blaise et al. further disclose that latex is obtained having a concentration of polymer solids content at 35 wt%. The polymer is then isolated from the latex by flocculation with sodium chloride in conventional manner and recovered by centrifugation or **by simply drying in an oven** (column 2, line 53-58). No water washing is disclosed by Blasie.

Such obtained PVDF homo polymer or copolymer would always contain some sodium acetate, the process of Blaise therefore anticipates the limitation of parent Claim 1 since the sentence of "optionally a potassium alkylsulphonate, optionally a surface-active additive and optionally a paraffin wax" rendering all the limitations on potassium alkylsulphonate, surface-active additive and paraffin wax being **in optional use**.

8. Regarding **Claim 2**, the claimed fluorinated surfactant having a formula of R_f-$COOSO_3H$ or its sodium salt is included in Examples 1-3 (column 3, line 17). Specifically, the sodium salt of perfluoro-octanoic acid is used.

Regarding **Claim 3**, such obtained PVDF homopolymer or copolymer would only carry some sodium acetate in a residual amount after work up the polymerization product. The

residual amount is less than 0.11 grams per process in a 3-liter scale accordingly (column 2, line 40-58, particularly see line 42).

Regarding the batchwise or semi-continuous process of **Claim 6**, it still carries the limitation of its parent Claim 1 with "optionally a potassium alkylsulphonate, optionally a surface-active additive and optionally a paraffin wax" rendering all the limitations on potassium alkylsulphonate, surface-active additive and paraffin wax being **in optional use**.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blaise et al. (US 4,025,709) in view of Sharma et al. (US 6,462,109 B1).

Regarding the limitation of parent **Claim 1**, **Blaise** et al. disclose a process for the emulsion **polymerization or copolymerization of vinylidene fluoride** in the presence of (A) **potassium persulfate** (free radical initiator), (B) **a fluorinated emulsifier**, (C) **sodium acetate** and (D) paraffin (column 1, line 65 – column 2, line 1; column 2, line 40-43).

It is noted that the use of a surface-active additive such as a fluorinated emulsifier is optional. In the case of not requiring (B) component, Blaise is then silent about "**not using surface-active additive (equivalent to (B) component**" on the PVDF polymers. **Sharma** et al. teach that in the course of making various types of vinyl-containing polymers, a surfactantless polymer latex can be prepared by using **a sulfo-polyester stabilizer** (column 5, line 30-54; column 11, line 22-39; column 12; column 8, line 50 – column 9, line 22). By doing so, **a more durable and lasting coating composition may result since no surfactant is used** (column 12, line 29-32).

In light of the fact that polymers produced by all the involved references are containing similar type of vinyl-containing monomers, which can be obtained through free radical induced emulsion polymerization and the like. Therefore, one having ordinary skill in the art would have found it obvious to **modify Blasie's polymerization process by replacing the traditional surfactant with a sulfo-polyester stabilizer** as taught by Sharma. One would expect one

advantage is to obtain a final PVDF latex product without the presence of any surfactant. **A more durable and lasting coating composition may be thereby resulted.**

11. Regarding **Claim 2**, the claimed fluorinated surfactant having a formula of R_f-$COOSO_3H$ or its sodium salt is included in Examples 1-3 (column 3, line 17). Specifically, the sodium salt of perfluoro-octanoic acid is used.

Regarding **Claim 3**, such obtained PVDF homopolymer or copolymer would only carry some sodium acetate in a residual amount after work up the polymerization product. The residual amount is less than 0.11 grams per process in a 3-liter scale accordingly (column 2, line 40-58, particularly see line 42).

Regarding the batchwise or semi-continuous process of **Claim 6**, it still carries the limitation of its parent Claim 1 with "optionally a potassium alkylsulphonate, optionally a surface-active additive and optionally a paraffin wax" rendering all the limitations on potassium alkylsulphonate, surface-active additive and paraffin wax being **in optional use**.

12. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blaise et al. (US 4,025,709) in view of Wu et al. (US 6,214,251 B1).

13. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blaise et al. (US 4,025,709) in view of Sharma et al. (US 6,462,109 B1), and further in view of Wu et al. (US 6,214,251 B1).

With respect to above two 103 rejections, the discussion of the disclosures of the prior art of Blasie for Claims 1-3 and 6 as well as Blaise/Sharma for Claims 1-3 and 6 of this office action are both incorporated here by reference.

Regarding **Claims 4-5**, the references of Blaise and Sharma, either in combination or alone, is silent about including the claimed potassium alkylsulphonate in the polymerization process. Wu et al. teach that in the course of making various PVDF polymers, the alkylsulfonate salt is added in polymerization process (column 5, line 22-25; column 17, line 24-30; column 18, line 43-46). By doing so, such alkylsulfonate-modified PVDF polymers are very useful in making polymer electrolyte as matrix polymer component (column 5, line 3-5; column 3, line 52-56).

In light of the fact that polymers produced by all the involved references are containing similar type of vinyl-containing monomers, which can be obtained through free radical induced emulsion polymerization and the like. Therefore, one having ordinary skill in the art would have found it obvious to **modify Blasie or Blaise/Sharma's polymerization process by adding a compound of alkylsulphonate salt** as taught by Wu. One would expect one advantage is to obtain a final PVDF latex product modified with alkylsulfonate salt. A more diversified PVDF

product useful in making polymer electrolyte as the matrix polymer component can be thereby obtained.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a method of making polyvinylidene fluoride (PVDF) homopolymer or copolymer by using sodium acetate and a potassium alkylsulphonate:

US Patent No. **6,780,935 B2 to Hedhli** et al. discloses the preparation of a fluoropolymer resin containing ionic or ignitable group (title; column 9, line 21-49). Although **PVDF seed latex is used as a seed** for polymerization of acrylic/vinyl monomers (see Tables 1-5), no sodium acetate or alkylsulfonate is included in the course of polymerization. Therefore, Hedhli fails to teach or fairly suggest the limitation of present invention.

US Patent No. **5,744,561 to Kappler** discloses the preparation of a fluorinated copolymer based on trifluoroethylene (VF_3) and tetrafluoroethylene (TFE) by using persulfate as initiator in the presence of sodium acetate (abstract, line 1-3; column 2, line 9-19 and 41-43; column 3, line 40-50). **Vinylidene fluoride (VDF)** is not used as comonomer. **Potassium alkylsulphonate** is not added. Therefore, Kappler fails to teach or fairly suggest the limitation of present invention.

15. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Dr. Henry S. Hu whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

Patent Examiner, art unit 1713, USPTO

June 20, 2005

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